

REMARKS

Claims in the case are 2-18, 20, 22 and 23, upon entry of this amendment. Claims 2-15 and 18 have been amended, Claim 23 has been added, and Claim 1 has been cancelled herein. The claims have been amended as to form, e.g., by inserting indefinite and definite articles where appropriate, including indentation, replacing "according to" with --of--, and removing "and/or." Additional amendments to the claims will be discussed further herein. Basis for added Claim 23 is found in original Claim 14 and at page 17, lines 23-25 of the specification.

Claims 1-18, 20 and 22 stand rejected under 35 U.S.C. §103(a) as being unpatentable over European Patent Application No. EP 0 728 811 (**Maruyama et al**) taken with United States Patent No. 4,946,885 (**Weil et al**) and United States Patent No. 5,849,827 (**Bödiger et al**). This rejection is respectfully traversed in light of the amendments herein and the following remarks.

The thermoplastic molding composition of Applicants' claims contains: (A) an aromatic polycarbonate and/or polyester carbonate; (B) a graft polymer; (C) optionally a thermoplastic vinyl (co)polymer and/or polyalkylene terephthalate; (D) a phosphazene selected from those represented by formulas Ia and/or Ib (see Claim 1); (E) finely divided inorganic powder having an average particle diameter of less than or equal to 200 nm; and (F) optionally a fluorinated polyolefin.

The thermoplastic compositions according to Applicants' present claims provide a desirable **combination** of: (i) excellent flame resistance; and (ii) physical properties including, improved weld-line strength, notched impact strength and environmental stress cracking resistance. Applicants wish to direct attention to the Examples, and in particular the Table on page 27, of the specification. Relative to comparative Example 1 (which does not contain particulate aluminum hydroxide), Examples 2 and 3 (according to the invention) provide a desirable combination of good flame resistance and improved mechanical strength. More particularly, Examples 2 and 3 have improved notched impact strength, softening point, weld line strength and environmental stress cracking resistance relative to the comparative composition of Example 1.

Maruyama et al disclose thermoplastic resin compositions comprising an aromatic polycarbonate, a graft copolymer and a phosphazene (abstract). The compositions of Maruyama et al are disclosed as optionally containing additives, including fillers, such as talc (page 5, lines 15-19). Maruyama et al do not disclose or suggest the particle size of the fillers that may optionally be present in their thermoplastic resin compositions. Applicants wish to point out that commercially available talc typically has an average particle size in excess of 200 nm. In particular, commercially available talcs typically have average particle size diameters (d_{50} values) of 0.5 μm (500 nm) to 8 μm (8000 nm). See the commercial talc data sheets in the appendix included herewith.

Maruyama et al teaches away from the use of phosphorous compounds other than phosphazenes, such as phosphates (e.g., trixlenyl phosphate) and phosphoric esters (e.g., phosphoric ester oligomers). See the examples, and in particular page 6, line 51 through page 7, line 39, and Table 1 on page 8 of Maruyama et al.

Weil et al disclose a flame retardant thermoplastic containing an effective flame retardant amount of phospham represented by the following empirical formula $(\text{PN}_2\text{H})_x$ (abstract and column 2, lines 37-38). The compositions of Weil et al are disclosed as optionally including finely divided infusible minerals, such as talc (column 4, lines 1-8). However, Weil et al do not disclose or suggest the particle size of the optional finely divided infusible minerals.

The thermoplastics disclosed by Weil et al include styrene-butadiene copolymers, ABS graft copolymers and polyamides. However, Weil et al do not disclose or suggest the presence of aromatic polycarbonates or polyester carbonates in their compositions. See column 1, line 66 through column 2, line 36 of Weil et al.

On page 3 of the Office Action of January 15, 2002, it is stated that Weil et al disclose the previous use of inorganic particulate compounds to promote the effectiveness of phosphazenes. Applicants counter that Weil et al provides no such disclosure or suggestion. Weil et al very generally disclose the previously proposed use of aminophosphazenes as flame retardants (column 2, lines 55-58). Weil et al go on further to state that precursors of phospham, namely **aminophosphazenes**, **are not equivalents to phospham** as they lack the requisite stability for use in

thermoplastics, such as nylon (column 2, lines 61-66). Weil et al are teaching away from the use of aminophosphazenes. Applicants wish to point out that phospham is different from and is not encompassed by the phosphazenes represented by formulas (Ia) and (Ib) of their present claims.

Bödiger et al disclose a thermoplastic molding composition comprising aromatic polycarbonate; extremely finely divided inorganic powder, e.g., aluminum oxides and TiO₂, having a mean particle diameter of 0.1 to 100 nm; and a flame retardant (abstract and column 7, lines 24-53). The phosphorous compounds of Bödiger et al are disclosed as preferably including those represented by formula (VIII) in column 8. However, Bödiger et al do not disclose or suggest the use of phosphazenes in their compositions.

The phosphazenes represented by formulas (I) and (II) on page 4 of Maruyama et al are disclosed as being essential components in their thermoplastic resin compositions. Maruyama et al teach away from the use of phosphorous compounds other than phosphazenes, such as phosphates (e.g., trixlenyl phosphate) and phosphoric esters (e.g., phosphoric ester oligomers). Weil et al disclose the essential presence of phospham in their compositions, and teach away from the use of phosphazenes, in particular aminophosphazenes. As such, neither Maruyama et al nor Weil et al provide the requisite teaching that would motivate one of ordinary skill in the art to combine their respective disclosures.


Bödiger et al do not disclose or suggest the use of phosphazenes in their compositions. Maruyama et al teach away from the use of phosphorous compounds other than phosphazenes, such as those phosphorous compounds disclosed by Bödiger et al and represented by their formula (VIII). As such neither Maruyama et al nor Bödiger et al provide the requisite teaching that would motivate one of ordinary skill in the art to combine their respective disclosures.

Weil et al disclose the essential presence of phospham in their compositions. The phosphorous compounds of Bödiger et al's compositions are disclosed as including phosphine oxides, derivatives of acids of phosphorus salts of acids and acid derivatives of phosphorus, and phosphorous compounds represented by their formula (VIII), none of which is remotely inclusive of phospham. As such, neither Weil et al nor Bödiger et al provide the requisite teaching that would motivate one of ordinary skill in the art to combine their respective disclosures.

In light of the amendments herein and the preceding remarks, Applicants present claims are deemed to be patentable and unobvious over Maruyama et al taken with Weil et al and Bödiger et al. Reconsideration and withdrawal of this rejection is respectfully requested.

In light of the preceding amendments and remarks, Applicants' presently pending claims are deemed to define an invention that is unanticipated, unobvious and hence, patentable. Reconsideration of the rejection and allowance of all of the presently pending claims is respectfully requested.

Respectfully submitted,

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VERSIONS WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS: (Marked-Up)

The following are versions of the amended claims with markings to show changes made thereto in the present Amendment.

1. (Cancelled)

2. (Twice Amended, Marked-Up) A [T]~~thermoplastic~~ moulding composition containing:

A) 40 to 99 parts by weight of at least one of aromatic polycarbonate and[/or] polyester carbonate;

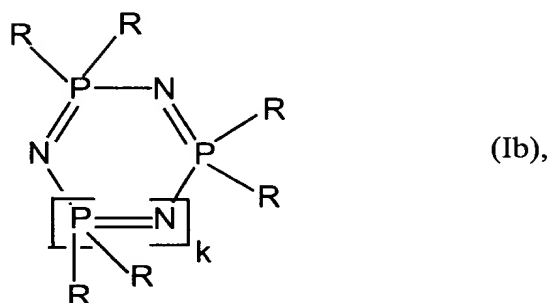
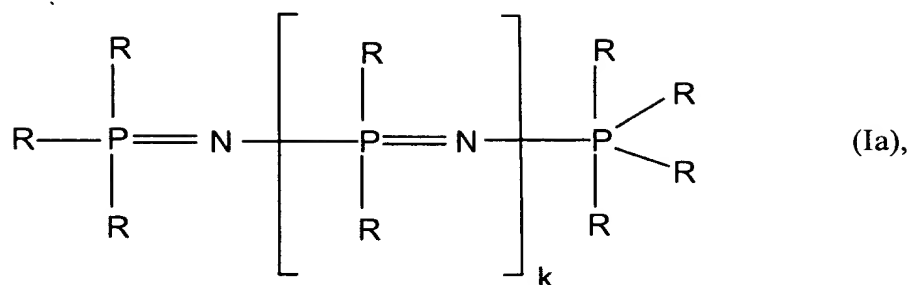
B) 0.5 to 60 parts by weight of graft polymer [of] comprising,

B.1) 5 to 95 wt.% of one or more vinyl monomers₁ [on] and

B.2) 95 to 5 wt.% of one or more grafting backbones having a glass transition temperature of <10°C;₁[.]

C) 0 to 45 parts by weight of at least one thermoplastic polymer selected from [the group comprising] at least one of vinyl (co)polymers and polyalkylene terephthalates[.];

D) 0.1 to 50 parts by weight of at least one component selected from the [group comprising] at least one phosphazene[s] of the formulae₁



in which

R is in each case identical or different and denotes (i) at least one of amino[,] and C₁ to C₈ alkyl, in each case optionally halogenated;[, or] and (ii) at least one of C₁ to C₈ alkoxy, C₅ to C₆ cycloalkyl, C₆ to C₂₀ aryl[, or] and C₇ to C₁₂ aralkyl, in each case optionally substituted by at least one of alkyl and[/or] halogen, and

k denotes 0 or a number from 1 to 15;[,]

- E) 0.5 to 40 parts by weight of finely divided inorganic powder having an average particle diameter of less than or equal to 200 nm; and
- F) 0 to 5 parts by weight of fluorinated polyolefin.

3. (Twice Amended, Marked-Up) The [M]moulding composition[s according to] of Claim 2 containing,

60 to 98.5 parts by weight of A,
1 to 40 parts by weight of B,
0 to 30 parts by weight of C,
1 to 18 parts by weight of D,
1 to 25 parts by weight of E, and
0.15 to 1 part by weight of F.

4. (Twice Amended, Marked-Up) The [M]moulding composition[s according to] of Claim 2 containing 2 to 25 parts by weight of C.

5. (Twice Amended, Marked-Up) The [M]moulding composition[s according to] of Claim 2 containing 5 to 25 parts by weight of D.

6. (Twice Amended, Marked-Up) The [M]moulding composition[s according to] of Claim 2, wherein vinyl monomers B.1 are mixtures prepared from

B.1.1 50 to 99 parts by weight of at least one of vinyl aromatics, [and/or] ring-substituted vinyl aromatics and[/or] methacrylic acid (C₁-C₈)-alkyl esters, and

B.1.2 1 to 50 parts by weight of at least one of vinyl cyanides, [and/or] (meth)acrylic acid (C₁-C₈)-alkyl esters and[/or] derivatives of unsaturated carboxylic acids.

7. (Twice Amended, Marked-Up) The [M]moulding composition[s according to] of Claim 2, wherein the grafting backbone B.2) is [selected from at least one] a rubber selected from [the group comprising] at least one of diene rubbers, EP(D)M rubbers, acrylate, polyurethane, silicone, chloroprene and ethylene/vinyl acetate rubbers.

8. (Twice Amended, Marked-Up) The [M]moulding composition[s according to] of Claim 2, wherein component D is selected from the group consisting of propoxyphosphazene, phenoxyphosphazene, methylphenoxyphosphazene, aminophosphazene and fluoroalkylphosphazenes.

9. (Twice Amended, Marked-Up) The [M]moulding composition[s according to] of Claim 2, wherein component E is selected from [among] at least one polar compound of one or more metals of main groups 1 to 5 or subgroups 1 to 8 of the periodic system with at least one element selected from [among] oxygen, hydrogen, sulfur, phosphorus, boron, carbon, nitrogen [or] and silicon.

10. (Twice Amended, Marked-Up) The [M]moulding composition[s according to] of [c]Claim 9, wherein component E is selected from [among] at least one polar compound of one or more metals of main groups 2 to 5 or subgroups 4 to 8 of the periodic system with at least one element selected from [among] oxygen, hydrogen, sulfur, phosphorus, boron, carbon, nitrogen [or] and silicon.

11. (Twice Amended, Marked-Up) The [M]moulding composition[s according to] of [c]Claim 10, wherein component E is selected from [among] at least one polar compound of one or more metals of main groups 3 to 5 or subgroups 4 to 8 of the periodic system with at least one element selected from [among] oxygen, hydrogen, sulfur, phosphorus, boron, carbon, nitrogen [or] and silicon.

12. (Twice Amended, Marked-Up) The [M]moulding composition[s according to] of Claim 2, wherein component E is selected from [among] at least one oxide, hydroxide, hydrous oxide, sulfate, sulfite, sulfide, carbonate, carbide, nitrate, nitrite, nitride, borate, silicate, phosphate, hydride, phosphite and phosphonate.

13. (Twice Amended, Marked-Up) The [M]moulding composition[s according to] of Claim 2, wherein component E is selected from [among] oxides, phosphates and hydroxides.

14. (Twice Amended, Marked-Up) The [M]moulding composition[s according to] of Claim 13, wherein component E is selected from [among] TiO_2 , SiO_2 , SnO_2 , ZnO , ZnS , boehmite, ZrO_2 , Al_2O_3 , aluminum phosphates, iron oxides, TiN , WC , $\text{AlO}(\text{OH})$, Sb_2O_3 , iron oxides, Na_2SO_4 , vanadium oxides, zinc borate, silicates, [such as Al silicates, Mg silicates, 1-, 2- or 3-dimensional silicates, mixtures thereof and] doped compounds and mixtures thereof.

15. (Twice Amended, Marked-Up) The [M]moulding composition[s according to] of Claim 2, wherein component E is selected from [among] hydrated alumin[i]um oxides, TiO_2 and mixtures thereof.

18. (Twice Amended, Marked-Up) A [P]process for the production of moulding compositions according to [claim 1] Claim 2, wherein components A to E and the optional[ly further] additives are mixed and melt-compounded.

23. (Added) The molding composition of Claim 14 wherein said silicates are selected from at least one of Al silicates, Mg silicates, 1-dimensional silicates, 2-dimensional silicates and 3-dimensional silicates.

APPENDIX

Data sheets from various commercial suppliers of talc, showing the average particle size of their talc products.